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PRE-APPEAL BRIEF REQUEST FOR REVIEW		Docket Number (Optional) OPP031367US	
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		First Named Inventor Kang-Hyun LEE	
		Art Unit 2813	Examiner Nguyen, Tuan H.
Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.			
This request is being filed with a notice of appeal.			
The review is requested for the reason(s) stated on the attached sheet(s). Note: No more than five (5) pages may be provided.			
I am the		<u>Andrew D. Fortney</u>	
<input type="checkbox"/>	applicant/inventor.	Signature	
<input type="checkbox"/>	assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/06)	Andrew D. Fortney, Ph.D.	
<input checked="" type="checkbox"/>	attorney or agent of record. Registration number <u>34,600</u>	559-432-6847	
<input type="checkbox"/>	attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____	67-31-2006	
		Date	
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.			
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Atty. Docket No. OPP031367US

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IN RE APPLICATION OF:

Kang Hyun Lee

: GROUP ART UNIT: 2813

APPLICATION NO: 10/728,706

FILED: December 5, 2003

: EXAMINER: Tuan H. Nguyen

FOR: METHOD FOR FABRICATING METAL LINE OF SEMICONDUCTOR DEVICE

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By:


Jennie HeatonPRE-APPEAL BRIEF REQUEST FOR REVIEW

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SIR:

Responsive to the final Office Action dated March 31, 2006, Applicant respectfully requests review of the following issues and arguments in the above-identified application prior to filing an Appeal Brief.

Issues and Arguments

Claims 1, 3, 4, 18, and 20-22 are patentable over the Background Section of the Present Application in view of U.S. Patent No. 6,750,150 to Chung et al.

The present invention relates to a method for fabricating a metal line of a semiconductor device. The method comprises forming a photoresist pattern on a metal layer, where the photoresist has a thickness of less than 9000 Å; forming a buffer layer on the photoresist pattern,

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including in an opening in the photoresist pattern; and removing the metal layer at a lower side of the opening by dry etching to form a plurality of metal lines (see the present Claims 1 and 22). In one aspect, the photoresist pattern has an opening of less than or equal to 0.26 μm width (Claim 1). In a related aspect, a ratio of the photoresist thickness to the width of the opening is less than about 3.5 (Claim 22). The method shows unexpected improvements in defect reduction relative to otherwise identical methods in which no buffer layer is formed on the photoresist pattern and either (i) the photoresist has a thickness greater than 9000 Å and a ratio of the photoresist thickness to the width of the opening is greater than about 3.5; or (ii) the photoresist has a thickness less than 9000 Å (see, e.g., paragraph 4 of the Declaration of Kang-Hyun Lee, submitted on January 12, 2006). The results are neither disclosed nor suggested by the applicable cited reference(s).

Clear Error No. 1: The Rejection Relies on Applicant's "Background of the Invention" as an Admission of Prior Art, when Applicant's "Background of the Invention" Contains No Such Admission. The Examiner improperly relies on the "Background of the Invention" section of the present application as prior art. Where the specification identifies *work done by another as "prior art,"* the subject matter so identified is treated as admitted prior art. MPEP § 2129, part II (emphasis added); *In re Nomiya*, 509 F.2d 566, 571, 184 USPQ 607, 611 (CCPA 1975). However, the present specification does not identify any material whatsoever as "prior art," much less work done by another. See the Request for Reconsideration filed May 31, 2006, p. 3, ¶ 1.

Clear Error No. 2: The Examiner Has Not Established Prima Facie Obviousness. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Also, the reference (or references when combined) must teach or suggest all the claim

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limitations. Finally, the teaching or suggestion to make the claimed combination must be found in the prior art, and not based on applicant's disclosure. *In re Vaack*, 947 F.2d 488 (Fed. Cir. 1991). See the Request for Reconsideration filed May 31, 2006, p. 3, ¶¶ 1-2.

Assuming, *arguendo*, that the available prior art discloses forming a metal layer on an insulation layer, forming a photoresist pattern having an opening on the metal layer, and removing the metal layer at a lower side of the opening by dry etching to form a plurality of metal lines, Chung et al. fails to teach or suggest forming a buffer layer on a photoresist pattern on a metal layer, where the photoresist has a thickness of less than 9000Å (see Claims 1 and 22, and the Request for Reconsideration filed May 31, 2006, p. 3, last ¶). **This limitation is not met by the available art cited against the present claims.**

Furthermore, the "test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." MPEP § 2143.01; *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002). Although the Examiner has provided motivation purportedly from the cited references (see ¶ 3 of the Continuation Sheet attached to the Advisory Action dated June 23, 2006), the Examiner has failed to state or indicate where such motivation can be found in the cited references. Thus, the Examiner has failed to make a *prima facie* case of obviousness with regard to Claims 1, 3, 4, 18, and 20-22.

Clear Error No. 3: The Examiner Has Not Adequately Addressed Applicant's Unexpected Results. Even if a *prima facie* case of obviousness was made, the present claims are patentable over the cited art because the invention produces unexpected results. A "greater than expected result is an evidentiary factor pertinent to the legal conclusion of obviousness ... of the claims at issue." MPEP § 716.02(u); *In re Cortill*, 711 F.2d 1496, 226 USPQ 1005 (Fed. Cir. 1985). Nonobviousness can be established if "the differences in results are in fact unexpected and unobvious and of both statistical and practical significance." MPEP § 716.02(b); *Ex parte*

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Gelles, 22 USPQ2d 1318, 1319 (Bd. Pat. App. & Inter. 1992). As shown in the Declaration of Kang-Hyun Lee filed on January 12, 2006, the present invention produces greater than expected results that are of statistical and practical significance, because it produces observed improvements in defect reduction and *transforms a process with commercially unacceptable levels of defects into a process with commercially acceptable levels of defects* (see paragraph 15 of the Lee Declaration; emphasis added).

Chung appears to be silent with regard to any effects of reducing the likelihood of "metal stringer" (or other short circuit-causing) defects as a result of forming a buffer layer on a photoresist pattern. Accordingly, Chung cannot suggest the observed (and thus, statistically significant) improvements in defect reduction provided by the present method (see the Request for Reconsideration filed May 31, 2006, pp. 5-8; the Amendment filed January 12, 2006, p. 7, last ¶-p. 12, last ¶; and the Declaration of Lee filed January 12, 2006, ¶¶ 5-22). Thus, the present invention provides unexpected results that are commercially (and thus, practically) significant, as evidenced by the Declaration of Lee. Therefore, any *prima facie* showing of the obviousness of independent Claims 1 and 22 in view of the available cited reference(s) is overcome by the evidence of unexpected results.

Claims 2 and 5-17 are patentable over the Background Section of the Present Application in view of Chung et al. and U.S. Patent No. 6,383,942 to Narita et al.

Clear Error No. 1: The Rejection Relies on "Applicant's Admitted Prior Art" when Applicant Has Made No Such Admission. The argument above with regard to Claims 1, 3, 4, 18, and 20-22 is incorporated herein by reference.

Clear Error No. 2: The Examiner Has Not Established Prima Facie Obviousness. The argument above with regard to Claims 1, 3, 4, 18, and 20-22 is incorporated herein by reference. As the Examiner correctly recognizes, Narita et al. do not disclose forming a buffer layer as claimed. As a result, Narita et al. cannot cure the deficiencies of the available prior art with

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regard to (i) forming a buffer layer on a photoresist pattern having an opening on a metal layer or (ii) a photoresist having a thickness of less than 9000Å (see Claims 1 and 22, and the Request for Reconsideration filed May 31, 2006, p. 10, 2nd full ¶). Thus, the Examiner has failed to make a *prima facie* case of obviousness with regard to Claims 2 and 5-17.

Clear Error No. 3: The Examiner Has Not Adequately Addressed Applicant's Unexpected Results. The argument above with regard to Claims 1, 3, 4, 18, and 20-22 is incorporated herein by reference. The present claims are patentable over the cited art because the invention produces unexpected results. One of ordinary skill in the art of semiconductor manufacturing would not understand or appreciate from reading the Narita and Chung patents that the present method (e.g., as recited in Claims 1 and 22) would provide the observed improvements in defect reduction (*i.e., from commercially unacceptable levels to commercially acceptable levels*; see the Request for Reconsideration filed May 31, 2006, p. 8, last ¶- p. 11, 2nd full ¶, and paragraph 15 of the Lee Declaration filed January 12, 2006).

Conclusions

In view of the above arguments, the application is in condition for allowance. Early notice to that effect is earnestly requested.

Respectfully submitted,



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